

transmission and reception of additional channels to the location burst, it is possible to accomplish this and to design a system which not only provides good location accuracy and capacity, but also provides for additional high capacity ancillary communication channels within the same 8 MHz bandwidth. MobileVision has designed such a system which employs both frequency division multiple access (FDMA) and time division multiple access (TDMA), both with the addition of a tight Time Scheduling System (TSS). This has resulted in very efficient use of the spectrum and a system that offers high capacity services.

In order to achieve this spectrum sharing even by the same provider, however, full control of the system involving the application of FDMA, TDMA and TSS is required. To be able to coexist-exist with channels provided by another party sharing the spectrum allocation would require such tight cooperative control that:

- a) it would be very difficult to achieve,(if at all possible), and,
- b) would drastically reduce the capacity of the location and services system, such that it would probably be rendered uneconomical.

## **V. Out of Band Transmissions**

### **Proposed Commission Specification**

The Commission has stated that the attenuation of emissions outside the band should be:

attenuation =  $55 + 10 \log P$       where P is the highest emission, in watts.

It is assumed that this specification refers to Radiated Spurious Emissions. These are defined as emissions from an equipment when loaded into a non-radiating load. Another possible method is to define the limits on Transmitter Sideband Spectrum.

The problem with spread spectrum signals is that the peak power is dependent upon the bandwidth of the measurement. For instance, if a spectrum analyzer is used to measure the power, then the peak reading depends upon the video and resolution bandwidth. It might be better therefore to specify the out-of-band emissions in terms of the peak power expressed in watts/Hz, or to define the bandwidth.

For "Radiated Spurious Emissions", the recommended specification should be defined as follows:

Level of any spurious spread spectrum emission should be not more than  $-(100 + 10 \log P)$  dBW/Hz.

where P is the total transmitted output power into a watt meter or load.

and the level of any spurious discrete emission should be not more than  $-(55 + 10 \log P)$  dBW

This allows the bandwidth of the Field Intensity Meter to be taken into account when measuring a spurious spread spectrum emission. It would also allow a spectrum analyzer to be used in place of an FIM.

The suggested value is equivalent to  $(55 + 10 \log P)$  in a 30 kHz bandwidth.

It should be noted that the Standard EIA/TIA-316-C sets the level at  $(43 + 10 \log P)$ .

Also in EIA/TIA-316-C, the standards for "Transmitter Sideband Spectrum" are:

- i) the envelope spectrum shall be attenuated at least 25 dB, relative to the carrier, spaced from the carrier by more than 50% of the authorized bandwidth,
- ii) the envelope spectrum shall be attenuated at least 35 dB, relative to the carrier, spaced from the carrier by more than 100% of the authorized bandwidth

The bandwidths involved in the spread spectrum systems are, of course, much greater than the 25 or 30 kHz channel spacing used in EIA/TIA-316-C, and therefore the specifications need to be tighter.

A specification along these lines would set some limits to the transmitted spread spectrum sidelobes and would be desirable. As the first sidelobe is contained within the authorized bandwidth, the level of the second, third, fourth, etc. sidelobes are of interest. For an 8 MHz bandwidth, the 50% specification, as per i) above, would encompass the second and third sidelobes, and the 100% specification, as per ii) above, would encompass all higher order sidelobes. It is therefore suggested

that a similar specification , for the spread spectrum, should be adopted as per below:

**"Transmitter Sideband Spectrum**

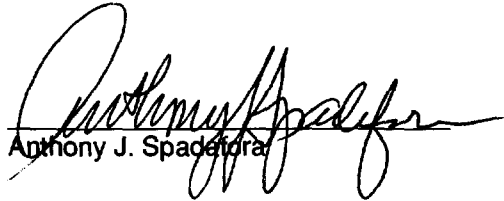
The envelope spectrum shall be attenuated at least 35 dB from the peak of the signal at any frequency spaced from the center frequency by more than 50% of the authorized bandwidth.

The envelope spectrum shall be attenuated at least 50 dB from the peak of the signal at any frequency spaced from the center frequency by more than 100% of the authorized bandwidth."

This specification is practical and can be met with careful filtering of the baseband. It does prevent the transmission of an unfiltered spread spectrum which could have second and third sidelobes at levels of only -18 dB and -21 dB relative to the peak

# **DECLARATION OF ANTHONY J. SPADAFORA**

I, Anthony J. Spadafora, am Vice President - Technology for METS, Inc., the general partner of MobileVision, L.P. I have prepared the foregoing Technical Appendix to the Comments of MobileVision, L.P. in response to the Federal Communications Commission's Notice of Proposed Rulemaking in PR Docket No. 93-61, Amendment of Part 90 of the Commission's Rules to Adopt Regulations for Automatic Vehicle Monitoring Systems and I declare under penalty of perjury that the foregoing Technical Appendix, to the best of my knowledge, is true and correct.

  
Anthony J. Spadafora

June 29, 1993